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& Environment
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2006 KDHE OVERVIEW OF UIC PROGRAM ADDRESSING CLASS I INDUSTRIAL WASTEWATER DISPOSAL WELLS

INTRODUCTION

The subsurface environment has been utilized for many years for disposal of liquid wastes. In Kansas, oilfield brines have been injected into formations containing naturally occurring mineralized water since the 1930's and industrial wastes have been injected into deep disposal formations since the 1950's. The generation of waste is an unavoidable result of the manufacturing and industrial processes which produce thousands of the products we use every day. Industry continues to reduce waste by recycling and waste minimization activities, but there are still wastes which require disposal. There are many environmentally sound disposal methods including incineration; biological or chemical treatment; properly located and constructed landfills; and for certain waste, disposal through injection wells.

After several incidents nationwide involving pollution traced to the use of injection wells, it was realized injection activities could contaminate groundwater if not conducted under strict controls. This realization promoted Congress to develop the Federal Underground Injection Control (UIC) program as a part of the Safe Drinking Water Act (SDWA) of 1974. It should be noted the State of Kansas has regulated the injection of oil field brines since 1930's and industrial wastes since 1950's. The Environmental Protection Agency (EPA) has delegated primary, regulatory authority for the federal program to those state agencies that have demonstrated an ability to implement a UIC program that meets EPA requirements promulgated under the SDWA. These states are referred to as *Primacy States.*

The Kansas Department of Health and Environment (KDHE) received primacy from EPA in December 1983 to administer the UIC program in Kansas for Class I, III, IV, and V wells. Kansas Administrative Regulations (K.A.R.) 28-46-1 through 28-46-5-44, in addition to KDHE Article 43 specifically concerning Class III wells, governs these classes of UIC wells in Kansas.

The purpose of the UIC program is to prevent contamination of fresh and usable groundwater supplies by injection activities and to conserve water resources. In Kansas, approximately 90% of the water used is supplied from groundwater. The major contamination problems in Kansas are from sources associated with human activity. The groundwater supply can be lost for use if not adequately protected from contamination. The most effective method of protection groundwater supplies is to prevent contamination. Prevention is much more cost effective, and has better results than cleanup activities.

This document has been printed only as an overview of that part of the KDHE UIC program addressing Class I injection wells. It is not intended to be an all-inclusive listing of requirements or conditions for Class I industrial waste disposal wells. This document may not be used as evidence in a court of law. Many of the requirements listed have been taken from the official Kansas Administrative Regulations publication. The permit application, policies, guidance, statutes, and rules and regulations and specific requirements for Class I waste disposal wells are available from KDHE.

DEFINITIONS

A well means a dug hole or bored, drilled or driven shaft whose depth is greater than it largest surface dimension or an improved sinkhole, or a subsurface fluid distribution system.

Well Injection means the subsurface emplacement of fluids through a well.

Injection well is a well into which fluids are injected.

A fluid is defined as any material that flow or moves, whether it is semisolid, liquid, sludge or gas.

As mentioned previously, the UIC program categorizes injection wells into five classes of wells. These are:

Class I: Wells used to inject hazardous wastes or dispose of industrial and municipal fluids beneath the lowermost formation containing, within one quarter (1/4) mile of the well bore, a source of fresh or usable water.

Class II: Wells used to inject fluids associated with the production of oil and natural gas or fluids/compounds used for enhanced hydrocarbon recovery. These wells normally inject below the lowermost fresh or usable water bearing zone into zones of former hydrocarbon production. These wells are regulated by the Kansas Corporation Commission. The contact for the KCC is (316) 337-6197.

Class III: Wells which inject fluids for the extraction of minerals.

Class IV: **Prohibited**: Wells which dispose of hazardous or radioactive wastes into or above a fresh or usable water bearing zone. These wells are prohibited by KDHE regulation K.A.R. 28-46-4.

Class V: Wells not included in other classes. Typically Class V injection wells are shallow wells used to place a variety of fluids below the land surface.

Injection into a Class I, III and certain types of Class V wells require obtaining a permit from KDHE prior to construction. Some types of Class V wells are not allowed by KDHE. As stated previously, injection into a Class IV well is prohibited in Kansas. Injection into a Class II well requires obtaining a permit from the Kansas Corporation Commission.

The subject of this document is that part of KDHE's UIC program addressing Class I industrial wastewater disposal wells.

INVENTORY

The number of Class I wells currently carried on KDHE's inventory as of January 1, 2007, are shown in Table 1. The inventory includes active wells, wells permitted but not yet constructed, plugged, wells converted to other uses and wells reclassified as a different Class of injection well. Forty-three of the active wells receive nonhazardous waste and six wells receive hazardous waste. The six wells receiving hazardous waste are at one facility located a few miles southwest of Wichita, Kansas. The wells permitted but not constructed are nonhazardous waste disposal wells.

Table 1

Active	Permitted but not Constructed	Plugged	Converted- Other Uses	Converted- Other Class
49	8	21	2	4

The inventory of Class I disposal wells in Kansas varies greatly in total depth of installation and dates of installation. The wells were installed over a span of years from 1943-2006. The depths range from approximately 1,300 feet bgs to more than 7,000 feet bgs. Table II gives a general picture of the depth variation of the active disposal wells.

Table 2
Total Drilled Depth of Active Class I Disposal Wells

1000-2000 bgs	2001-4000 bgs	4001-6000 bgs	6001-8000 bgs
3	11	31	4

Wells with a total depth below 2000 feet are in Johnson (2) and Montgomery (1) counties. Wells with a total depth of 2000-4000 feet are located in the following counties: Barton (1), Ellsworth (4), Kearney (1), Lyon (1), Montgomery (2), and Rice (2). Wells with a total depth of 4000-6000 feet are located in the following counties: Harper (2), Kiowa (1), McPherson (7), Reno (9), Rice (4), and Sedgwick (8). Wells with a total depth of 6000-8000 feet are located in Finney (2) and Ford counties (2).

Table 3
Total Number of Wells Installed by Date of Construction

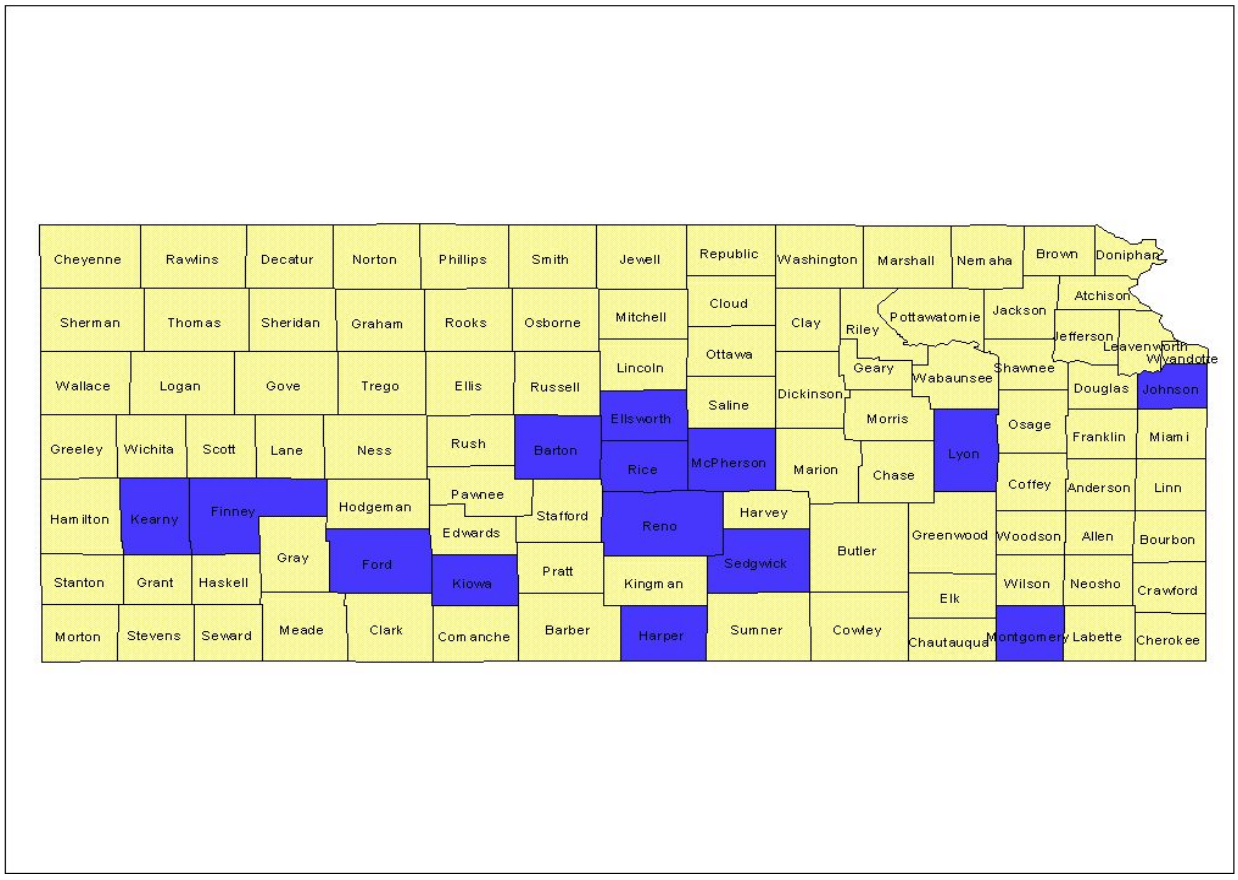
1940-1960	1961-1980	1981-2000	2001-2007
5	19	16	7

A well located in McPherson County was constructed in 1943 and is still operating today. A properly completed, operated, tested and maintained well should last indefinitely.

LOCATION OF CLASS I INJECTION WELL FACILITIES

There are currently 27 industrial facilities located in Kansas which utilize a total of forty-nine Class I wells for the disposal of industrial waste. Counties with active Class I Disposal wells are indicated by blue shading on Figure 1 .

Figure 1



DESCRIPTION OF WASTE DISPOSED

The use of Class I disposal wells are considered by KDHE only for those wastes that cannot feasibly be treated, stored or disposed by other methods. The KDHE Bureau of Water Policy Memorandum #91-1 outlines the policy for determining the types of waste that are eligible for disposal through Class I disposal wells. A copy of this policy memorandum can be obtained by contacting KDHE.

Class I industrial waste disposal wells in Kansas are used at the following types of facilities: hydrocarbon storage in solutioned salt cavities; meat packing plants using hide curing and/or tanning processes; chemical manufacturing plants; salt solution mining facilities; solid waste landfill for disposal of leachate; natural gas compressor stations and natural gas fractionation plants. Some common wastes disposed include cooling tower blowdown; boiler blowdown; contaminated stormwater runoff; contaminated groundwater; waste brines from hydrocarbon storage well, hide curing and salt solution mining operations and chemical process wastes.

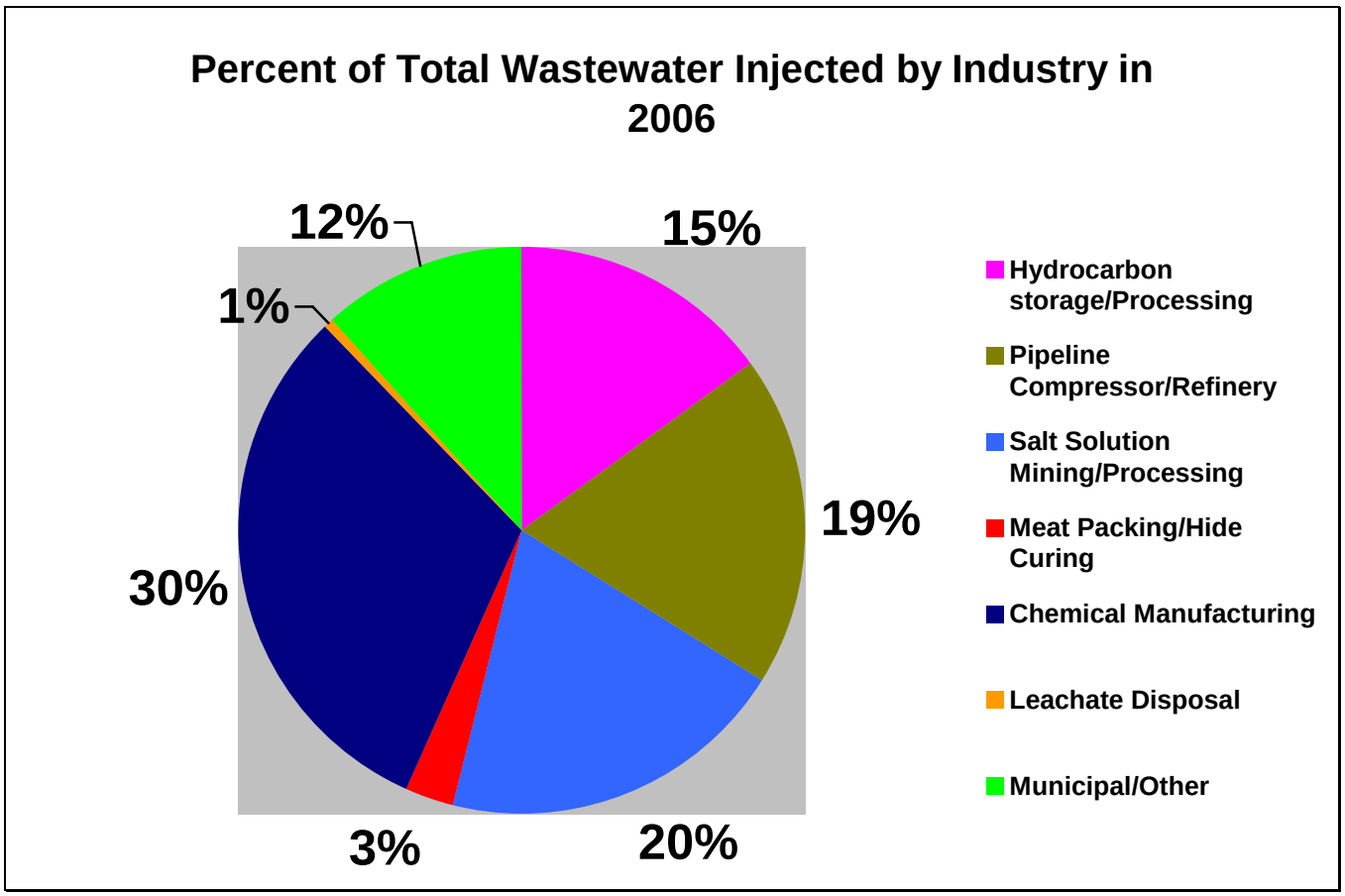
The volume of waste injected for each type of industry for calendar year 2006 is shown in Table 2. Volumes include recovered contaminated groundwater. Figure 2 shows the percentage of waste injected by industry type.

Table 2.

Volume of Wasted Injected Per Industry Type in 2006

No. of Facilities	Industry	Percent of Total Volume	Volume (Total Gallons)
10	Hydrocarbon storage/Processing	15	442,115,238
4	Pipeline Compressor/Refinery	19	556,758,635
2	Salt Solution Mining/Processing	19.9	582,754,049
3	Meat Packing/Hide Curing	2.8	84,308,996
4	Chemical Manufacturing	31.2	915,664,913
1	Leachate Disposal	0.5	13,359,031
3	Municipal/Other	11.6	342,603,257

Figure 2



The total volumes of wastewater injected through all Class I disposal wells combined for calendar years 2000-2006 are shown in Table 3. Figure 3 shows these data graphically.

Table 3
Total Volume of Wastewater Injected 2000-2006

Year	Total Volume Injected (Gallons)
2000	3,015,141,926
2001	2,221,104,641
2002	1,762,151,510
2003	1,827,869,019
2004	2,597,442,187
2005	2,699,699,276
2006	2,937,564,119

TOTAL VOLUME INJECTED THROUGH CLASS I WELLS
Figure 3

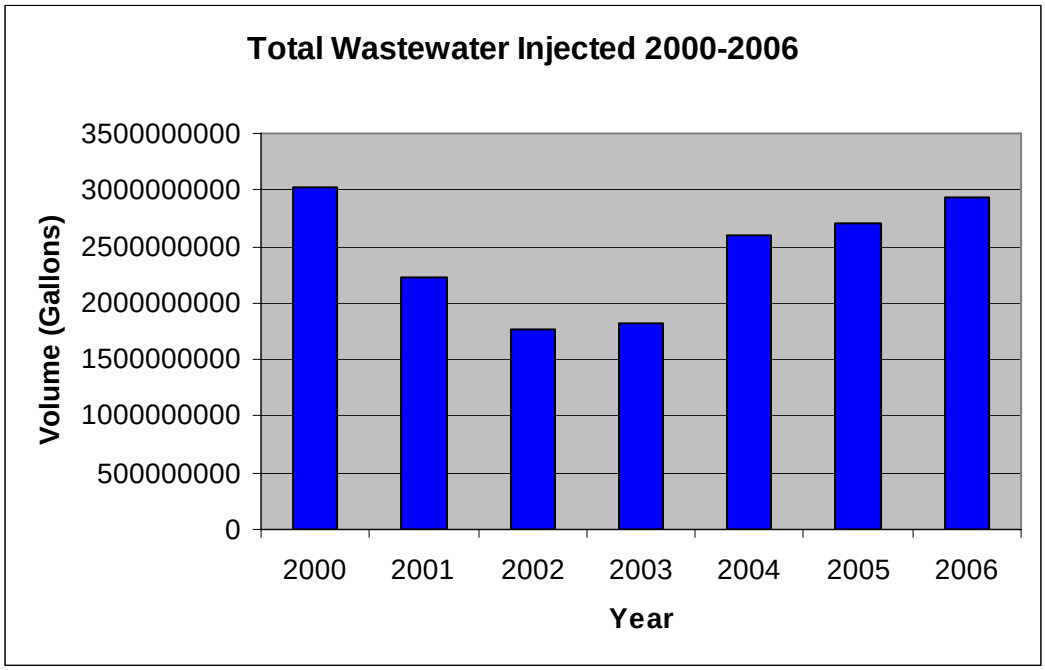


Figure 4 depicts the drastic reduction in wastewater after closure of a natural gas storage facility. Also, other storage facilities experienced reduced wastewater volumes the same year.

Graphs Depicting Wastewater Volumes by Waste Category
Figure 4

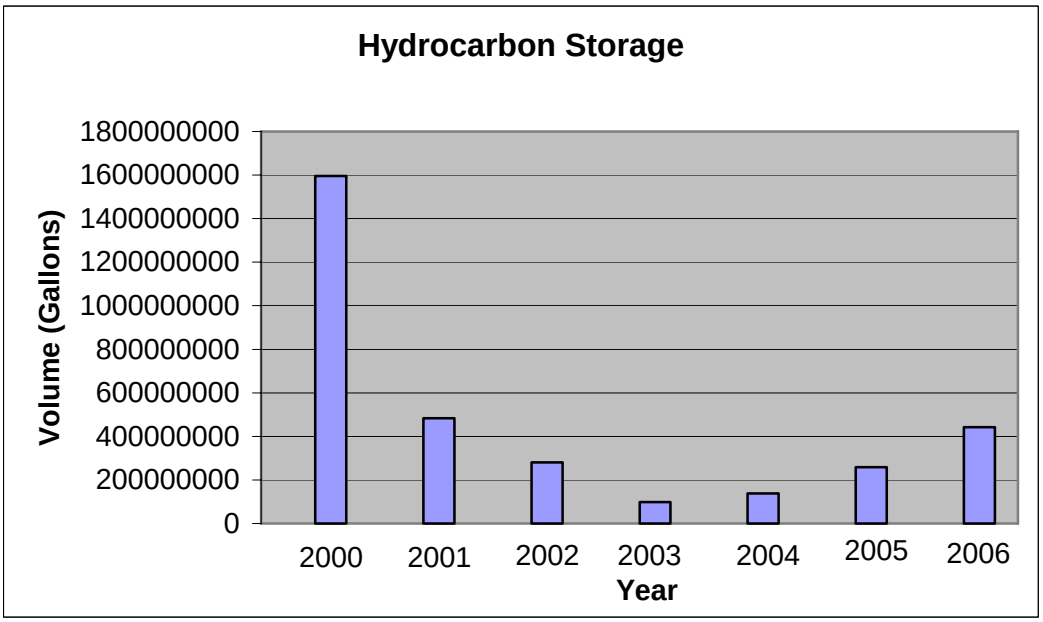


Figure 5 shows a large increase in wastewater volume beginning in 2004 coinciding with the installation and operation of two new wells at a refinery receiving wastewater that was formerly handled by a NPDES permitted surface water discharge.

Figure 5

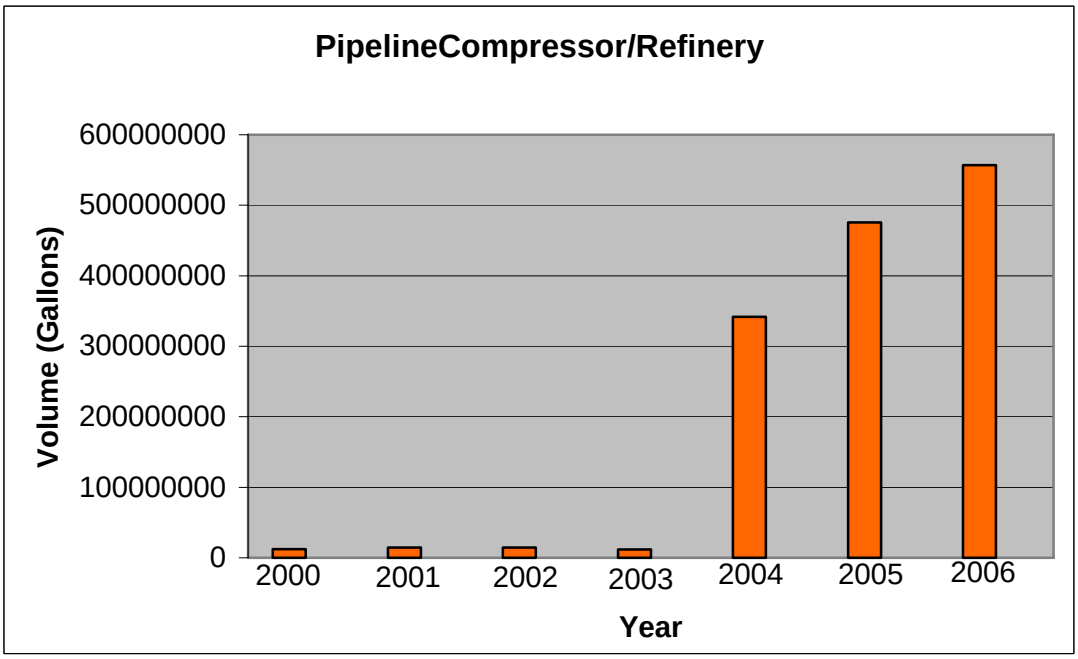


Figure 6 shows a slight increase in wastewater injection.

Figure 6

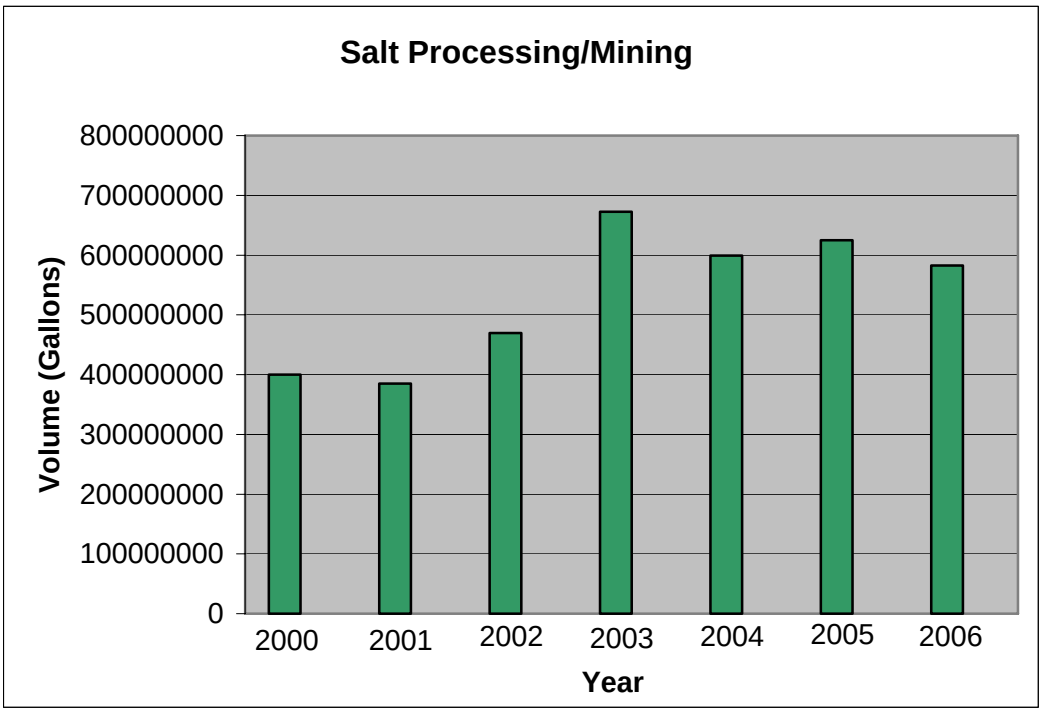


Figure 7 shows a significant increase in wastewater volume being injected beginning in 2002 due to the installation of a new well at a meat packing facility receiving wastewater that was formerly handled through a NPDES permitted surface water discharge.

Figure 7

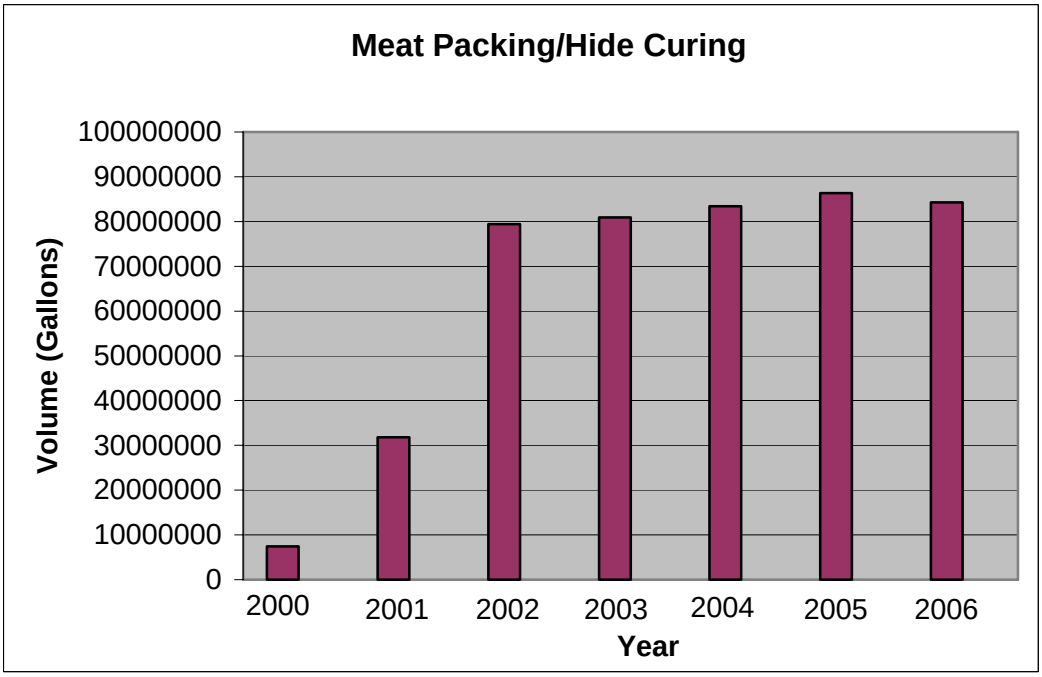


Figure 8 shows a fairly steady wastewater injection volume.

Figure 8

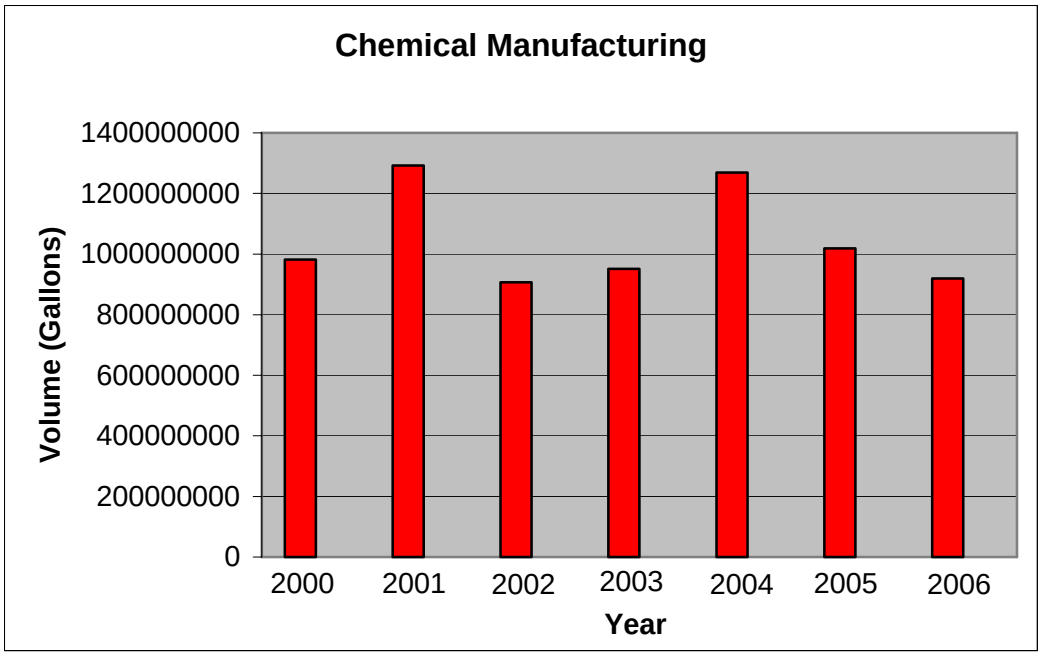


Figure 9 reflects a new and growing trend in the Class I well program in Kansas. Municipalities are beginning to use Class I wells to inject reject water from drinking water treatment facilities. This graph illustrates how, prior to 2004, there was no wastewater of this type being injected into Class I wells in Kansas. However, installation and operation of this type of well is becoming more common. The wells installed to inject this type of wastewater are typically high volume.

Figure 9

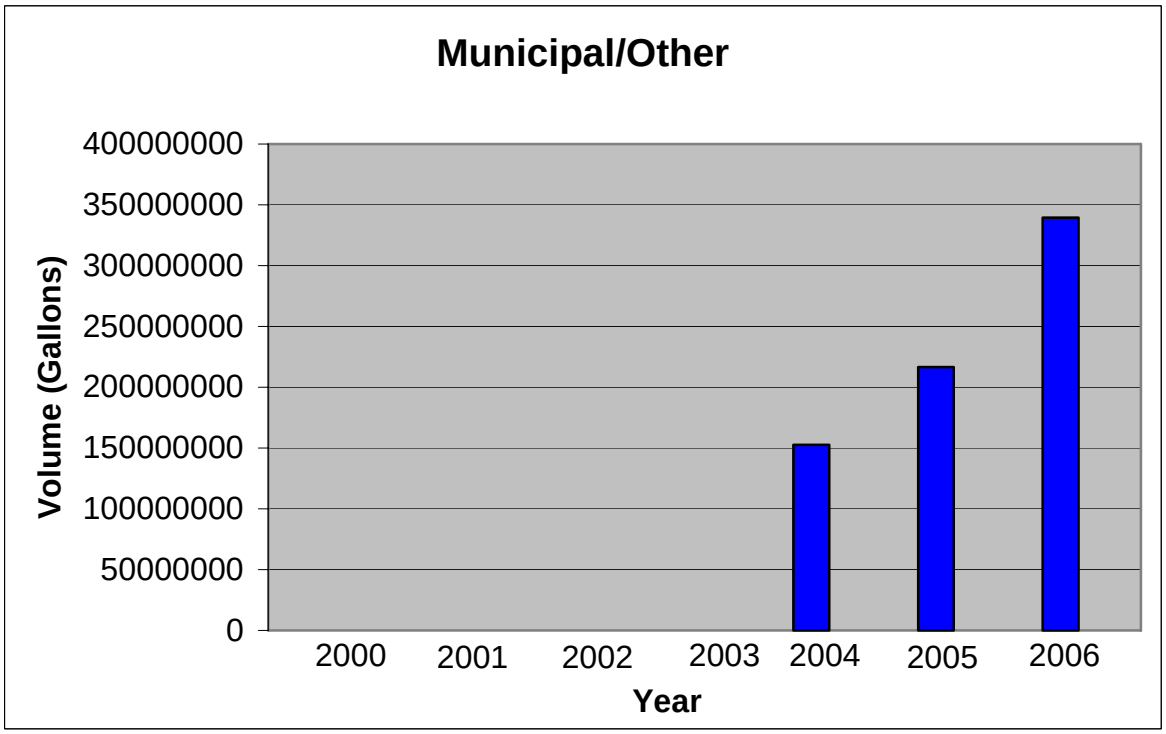
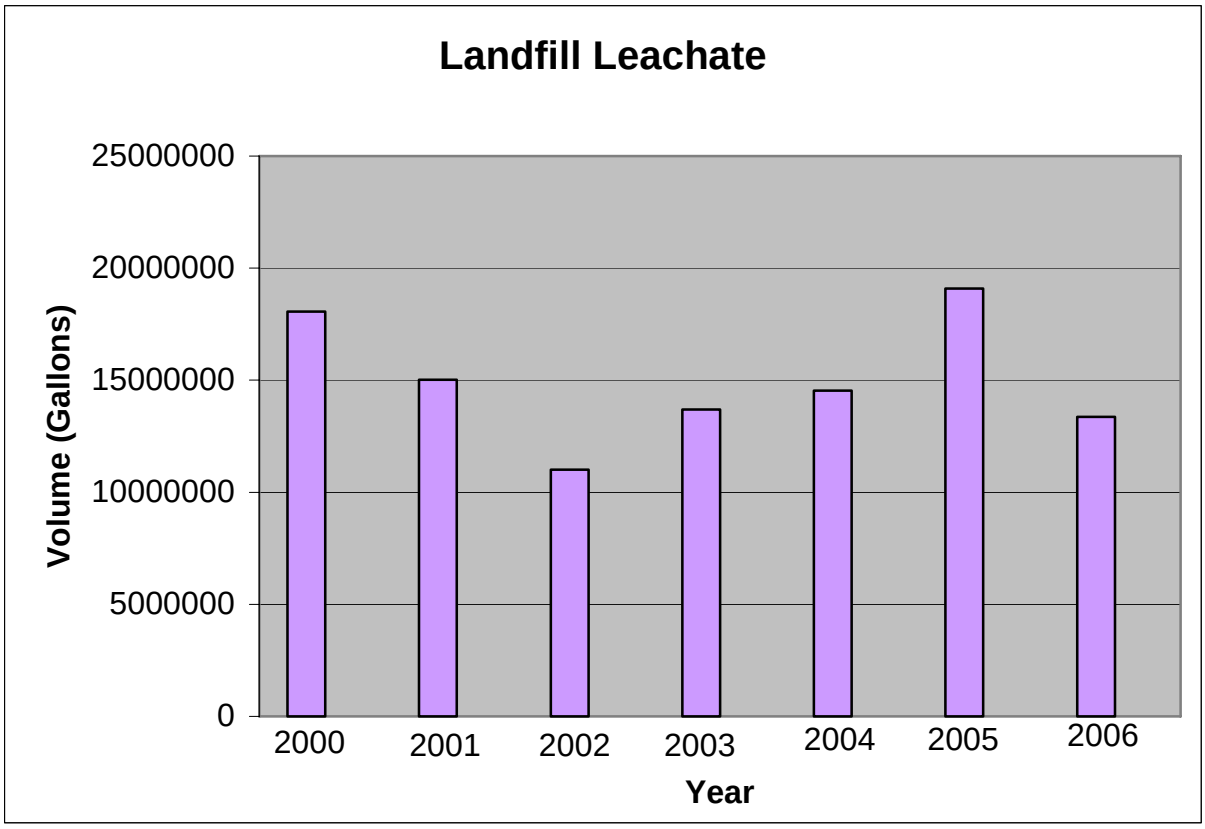


Figure 10 illustrates yearly fluctuations in the amount of landfill leachate being injected.

Figure 10



In summary, total wastewater volume injected dropped overall beginning in 2001 through 2004, due primarily to loss of wastewater volume in the hydrocarbon storage industry. Declines were also noted in chemical manufacturing during the years 2002-2003. Some manufacturing facilities ceased large volume operations during those years, resulting in this general downward trend. Most of the industries experiencing an increase in wastewater injected were due to an increase in new wells receiving wastewater formerly handled by other means or because of a new source. However, the overall increase in total wastewater volume in 2004-2006 is largely due to new municipal and refinery sources, making up for the loss of volume in the hydrocarbon and manufacturing industries.

SITE CHARACTERISTICS NECESSARY FOR A CLASS I DISPOSAL WELL TO PREVENT ENDANGERMENT OF PUBLIC HEALTH AND ENVIRONMENT

The proposed site for location of a Class I disposal well should, at a minimum, have the following characteristics to be suitable for the injection of wastewater. **The injection of wastewater shall not endanger public health or the fresh and usable waters, soils or mineral resources.**

- Injection interval sufficiently thick, with adequate porosity and permeability to accept waste at the proposed injection rate without necessitating excessive injection pressures.

- Injection interval of large enough areal extent so that injection pressure is minimized and so that injection waste will not reach discharge areas.

- Injection interval preferably "homogeneous" (without high-permeability lenses or streaks), to prevent extensive fingering of the waste-vs-formation water contact, which would make adequate monitoring of the waste movement extremely difficult or impossible.

- Overlying and underlying strata (confining beds) sufficiently thick and impermeable to confine waste to the injection interval.

- Structural geologic conditions generally simple; that is, a site reasonably free of complex faulting and folding.

- Site is an area of minor to moderate earthquake damage and low seismic activity so that the hazard of earthquake damage or triggering seismic events is minimized.

- Slow lateral movement of fluid in the injection interval, under natural conditions, to prevent rapid movement of waste away from the injection site, possible to a discharge area.

- Formation-fluid pressure normal to low so that excessive fluid pressure is not needed for injection.

- Formation temperature normal to low so that the rates of undesirable reactions are minimized, including corrosion.

- Wastewater compatible with formation fluids and minerals or can be made compatible by treatment, emplacement of a buffer zone or other means.

- Formation water in the disposal formation of no apparent value, i.e., not potable, unfit for industrial or agricultural use, and not containing minerals in economically recoverable quantities.

- Injection interval adequately separated from fresh and usable water zones, both horizontally and vertically.

- Waste injection does not endanger present or future use of mineral resources (coal, oil, gas, brine or others).

- Waste injection does affect existing or planned gas-storage or freshwater-storage projects.

- No unplugged or improperly abandoned wells penetrating the disposal formation in the vicinity of the disposal site, which could lead to contamination of other resources.

- Accept fluid without the use of pump pressure.

DESCRIPTION OF DISPOSAL FORMATION IN KANSAS

For most areas of Kansas, except in the southeast part of the state, the formation most suitable for the disposal of industrial wastewater is the Arbuckle Group. There are areas of the northeast part of the state where the Arbuckle formation is not present. The Arbuckle rocks are Ordovician in age (approximately 440 – 500 million years old) and originally consisted of limestone. The Arbuckle now consists generally of dolomite. Over time, diagenetic alteration from lime to dolomite has occurred.

Dolomitization has resulted in increased porosity. This dolomite has also undergone dissolution during cycles of uplifting and erosion. Walters (1958) indicated basement tectonics probably controlled development of an extensive joint system in the Arbuckle dolomite. Circulation of meteoric water through the fractures ultimately developed a cavernous porosity. The Arbuckle in most areas is capable of accepting significant volumes of liquid under “gravity” flow (350+ gpm).

Another formation currently used for Class I disposal in Kansas is the Shawnee Group. The Cedar Hills Formation was utilized for disposal in past years but is not permitted for new Class I disposal wells per KDHE, Bureau of Water, Policy #90-3 because of the potential for an undesirable pressure build-up in the formation and questionable confining units in many areas of the state. A copy of this policy memorandum can be obtained by contacting KDHE. The Shawnee Group and Cedar Hills generally have low permeability and accept only limited volumes of liquid under gravity flow. The figures on the following pages depict the general geology relevant to Class I disposal wells in Kansas.

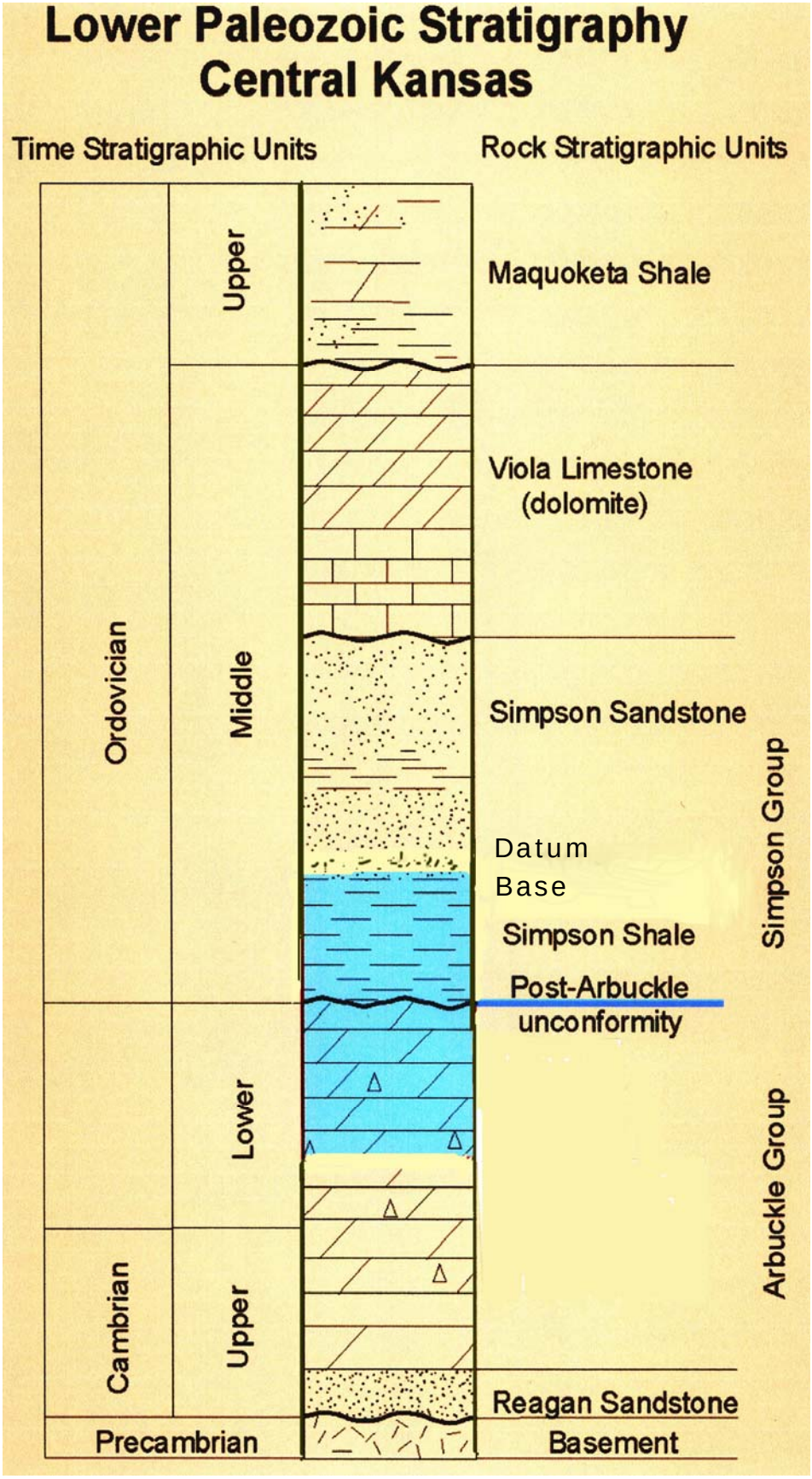
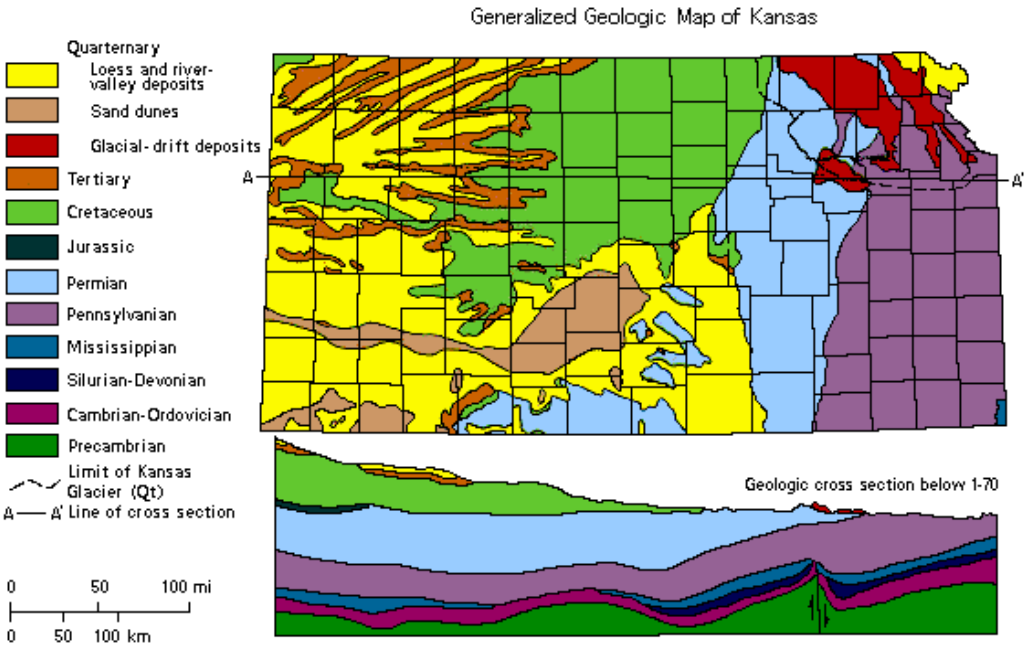


Figure 11 – Generalized Geologic Section

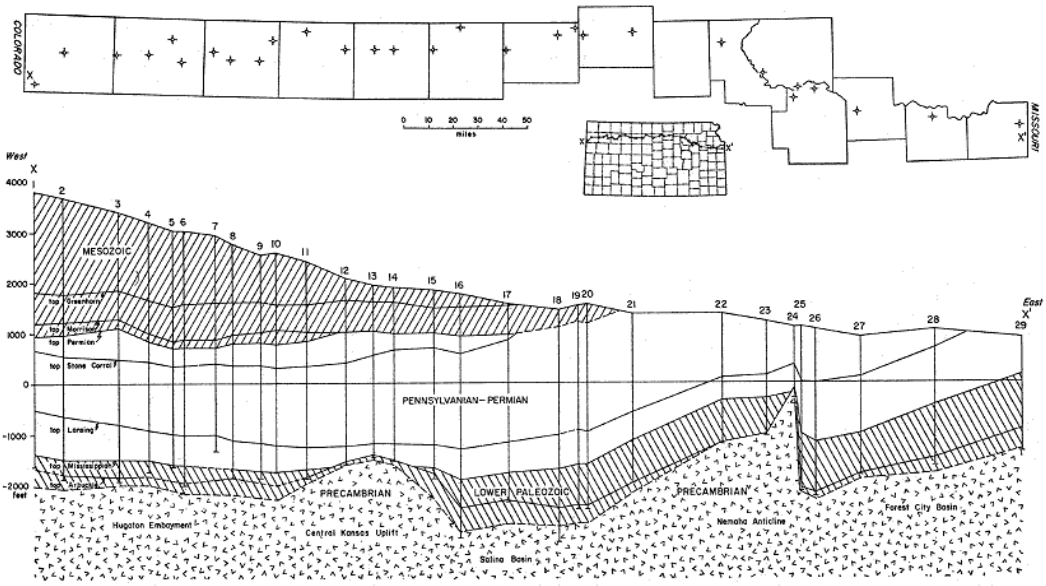
Source: Arbuckle Reservoirs in Central Kansas: Relative Importance of Depositional Facies, Early Diagenesis and Unconformity Karst Processes on Reservoir Properties - KGS

Figure 12 is a generalized geologic map of Kansas

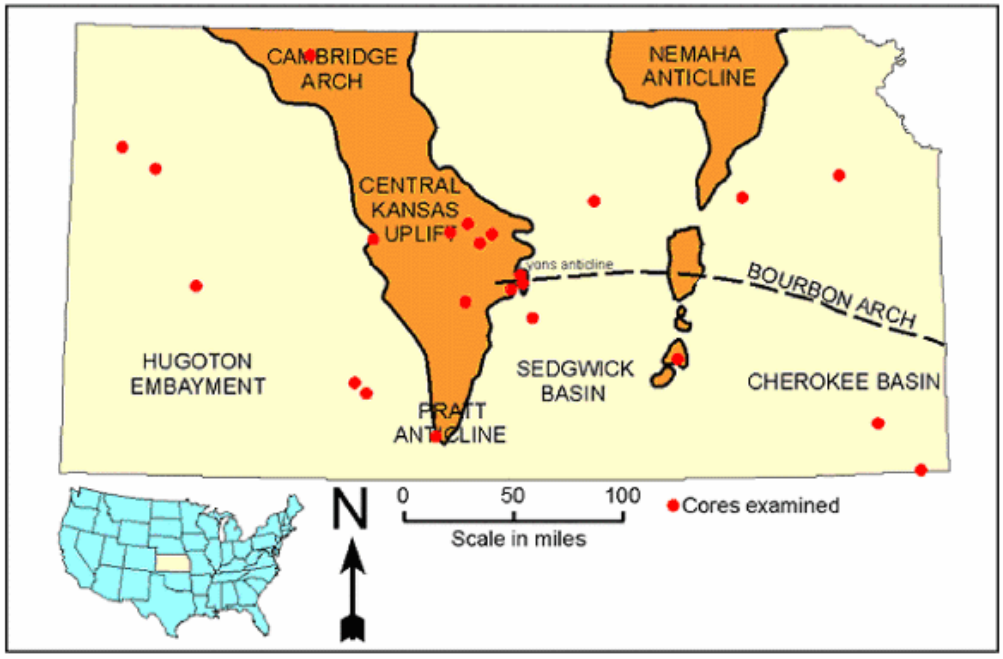


Source: Kansas Geologic Survey Postcard

Figure 13 is an east-west geologic cross-section



Source: KGS "Geologic History of Kansas"



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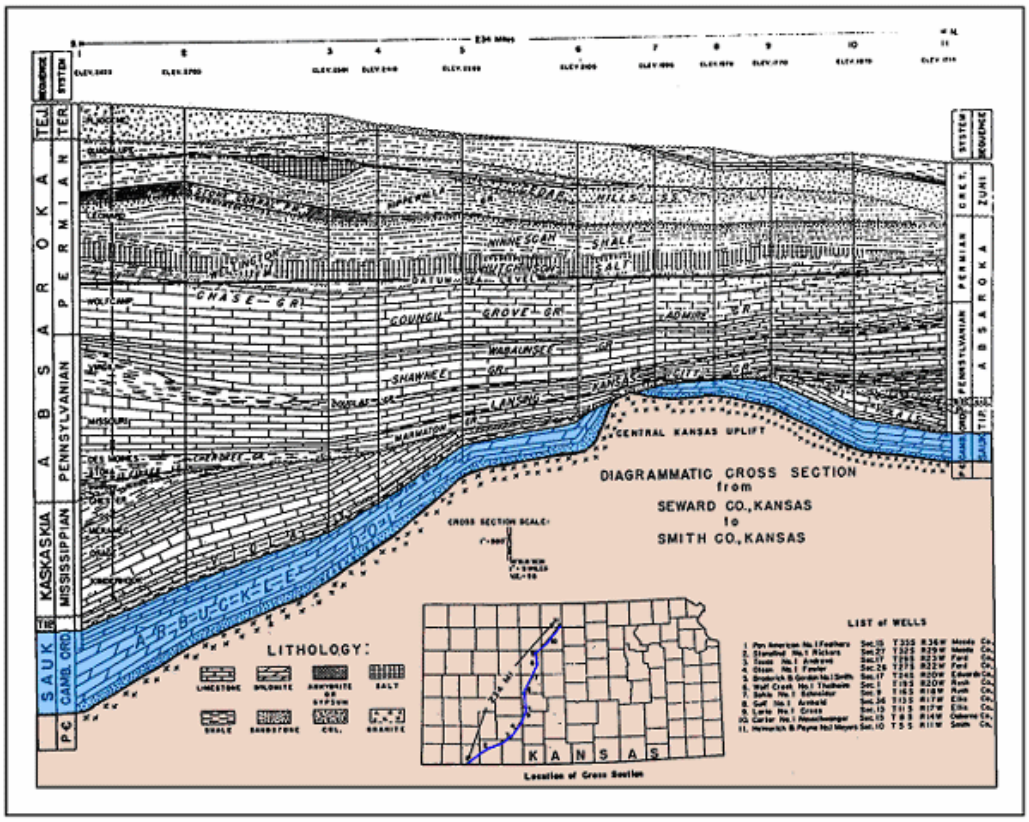

B

Figure 14 (top) depicts the major structural features in Kansas and Figure 15 above is a cross-section depicting the Arbuckle Formation from KGS Open File Report 2003-59

Figure 16 - Principal Aquifers of Kansas

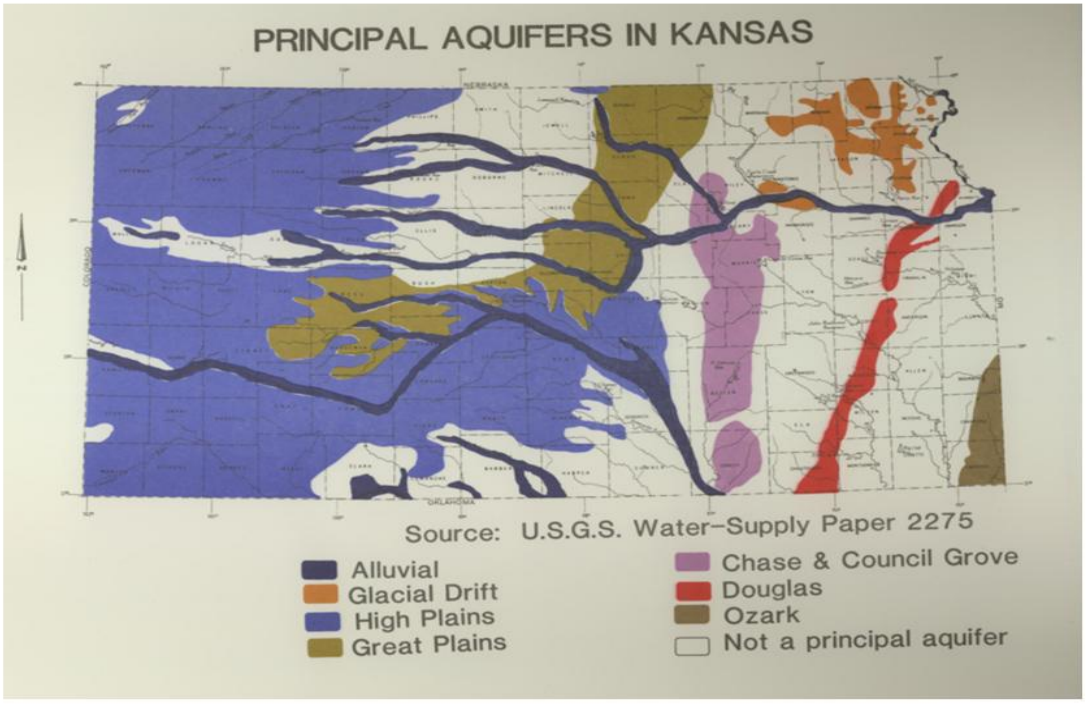

Figure 17 depicts the thickness and extent of the Arbuckle in Kansas.
(From USGS Open-File Report 86-491)

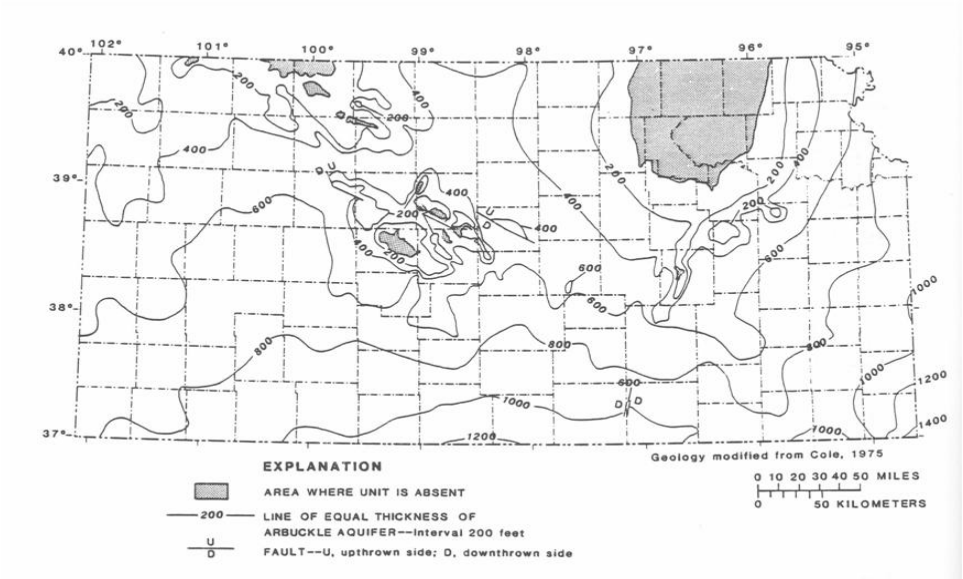

Figure 18 - Depicts permeability values expressed in millidarcies for various locations as determined by formation pressure fall-off test conducted on Class I disposal wells.

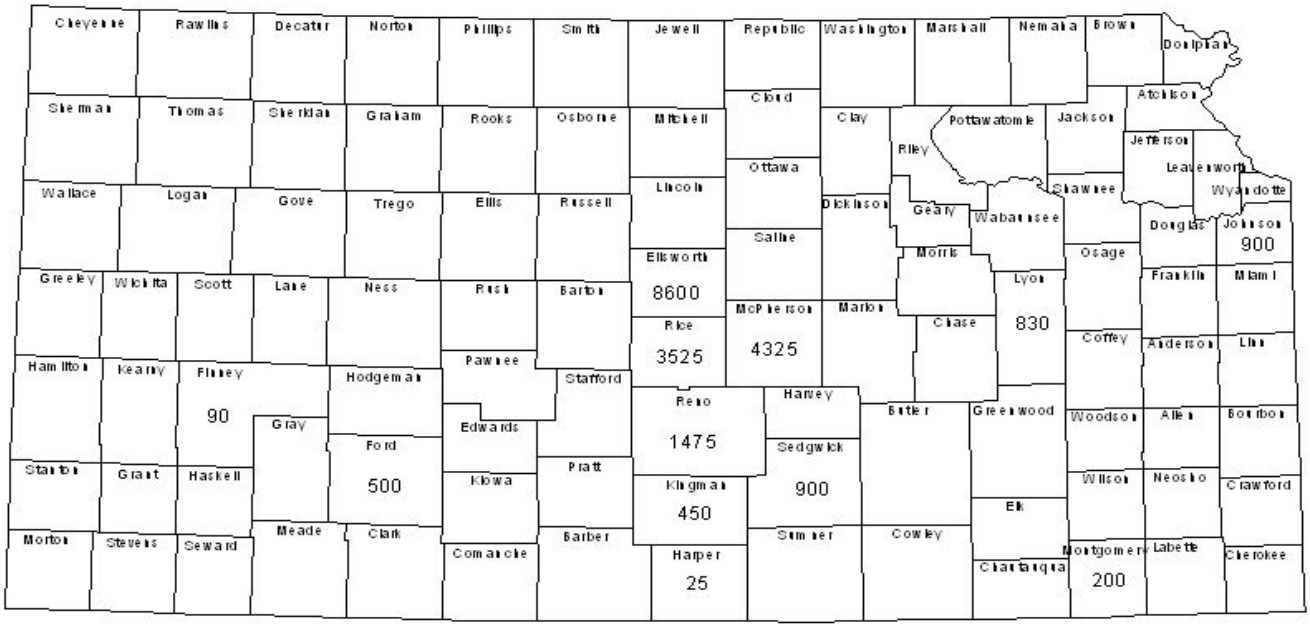

Figure 19 depicts the distribution of chloride concentration in the Arbuckle.

Figure 19: Distribution of chloride concentration in water from the Arbuckle aquifer. (From USGS Open-File Report 86-491)

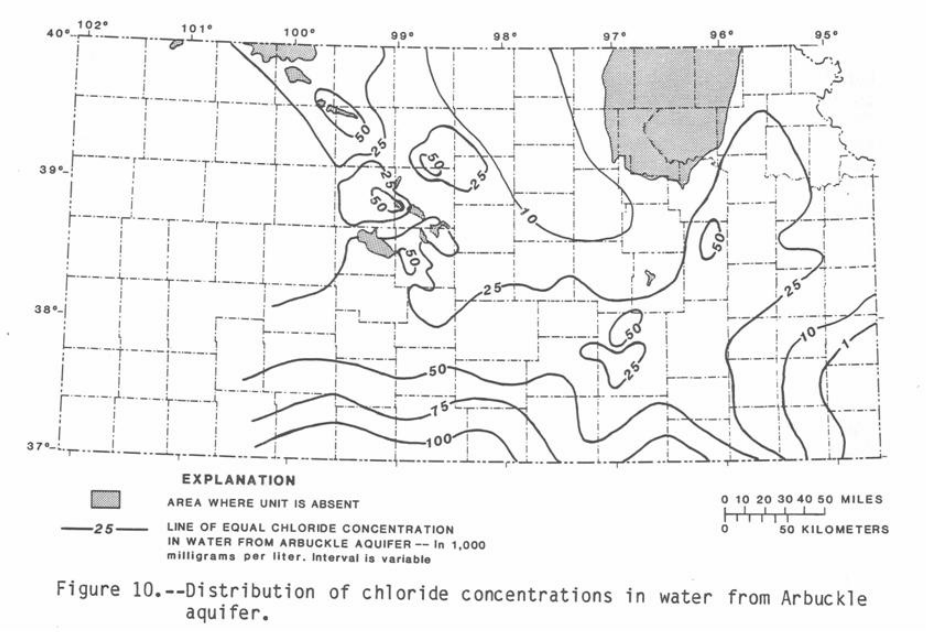

Figure 10.--Distribution of chloride concentrations in water from Arbuckle aquifer.

SIGNIFICANT REQUIREMENTS

DESCRIPTION

This section lists only the more significant requirements for Class I industrial waste disposal wells and is intended to give only an overview. This is not an all-inclusive listing of requirements. The permit application, permits, policies, statues and rules and regulations established the specific requirements for Class I hazardous wastewater disposal wells. Many of the requirements are applied equally to both the hazardous and nonhazardous water disposal wells. In most cases, KDHE does not distinguish between hazardous and nonhazardous water disposal wells because both inject wastes that have the potential to endanger public health or the environment if not handled properly, regardless of whether the waste is hazardous on nonhazardous. A copy of the KDHE Article 46 – Underground Injection Control Regulations is can be obtained by contacting KDHE.

The requirements listed apply to both hazardous and nonhazardous waste Class I disposal wells unless otherwise noted.

A. Permitting Requirements

Injection wells hall not be constructed, and underground injection shall not take place, unless authorized by permit (K.A.R. 28-46-25). A Class I hazardous or nonhazardous disposal well shall not be constructed, and underground injection shall not take place, unless authorized by a permit issued by the KDHE, Bureau of Water. A permit application can be obtained by contacting KDHE. In addition, to inject hazardous wastewater, a petition for exemption from the Federal ban on injection of hazardous wastewater must be filed with the Environmental Protection Agency (EPA) and approval of the petition obtained from EPA. The EPA can be contacted at (913) 551-7584.

B. Construction Requirements

The well shall be cased and cemented such that: 1) injected fluids and injection zone or other formation fluids do not cause deterioration of the water quality of fresh and/or usable water zones, 2) the loss of fresh and/or usable water due to downward migration is prevented, 3) the release of injected fluids into an unauthorized zone is prevented, and 4) appropriate testing devices and workover tools can be used.

- The casing and cement used in the construction of the well should be designed for the life expectancy of the well. (K.A.R. 28-46-9 and K.A.R. 28-46-29)

- New surface casing shall be set and cemented through all fresh and usable water zones and any other zones determined necessary by the KDHE. (K.A.R. 28-46-9 and K.A.R. 28-46-29)

- New long string casing shall be set into the disposal zone and cemented from bottom to surface. (K.A.R. 28-46-9 and K.A.R. 28-46-29)

- Injection shall be through tubing set on a mechanical packer immediately above the injection zone and the annulus between the injection tubing and the long string casing

filed with a liquid approved by KDHE. A pressure approved by KDHE shall be maintained on the annulus. The tubing and packer shall be designed for the expected service. (K.A.R. 28-46-9, K.A.R. 28-46-29, and K.A.R. 28-46-30)

A diagram showing a typical Class I well and monitoring devices is included as Figure 14.

C. Operational Requirements

The well shall be operated in a manner that does not endanger public health or the environment.

- Wellhead injection pressure is limited to "gravity" flow and shall not exceed 35 psig at the wellhead. The maximum operating pressure shall not exceed the fracture pressure. (K.A.R. 28-46-28)

- The injected fluid shall meet minimum pretreatment requirements set by KDHE to prevent contamination of underground sources of drinking water supplies; to protect the public health; to take into account environmental considerations and to render injected fluid compatible with the injection tubing, casing, and the disposal formation. The wastewater stream shall be compatible with the well materials with which the waste is expected to come into contact and with the confining and injection zone material. (K.A.R. 28-46-24 and K.A.R. 28-46-30)

- The well shall not be operated in a manner that allows the movement of fluids containing an contaminant into underground sources of drinking water. (K.A.R. 28-46-27)

D. Monitoring & Reporting Requirements

The operation of the well must be monitored to ensure compliance with the rules, regulations and permit requirements and to demonstrate the well is operated in a manner that does not endanger human health or the environment.

- Samples and measurements taken for the purpose of monitoring shall be representative of the activity being monitored. (K.A.R. 28-46-6 and K.A.R. 28-46-30)

- All analyses of the injected wastewater required by the permit shall be conducted by a Kansas certified laboratory. (K.A.R. 28-46-43)

- The injected fluid shall be analyzed with sufficient frequency to yield representative data of the characteristics. (K.A.R. 28-46-9 and K.A.R. 28-46-30)

- Both continuous recording devices and gauges shall be used to monitor injection pressure and the pressure on the annulus between the injection tubing and the longstring casing. (K.A.R. 28-46-9 and K.A.R. 28-46-30)

- The annulus liquid level shall be monitored by the use of an annulus seal pot. (K.A.R. 28-46-9 and K.A.R. 28-46-30)

- The injection volume shall be monitored by use of a flow meter or continuous recording device. (K.A.R. 28-46-9 and K.A.R. 28-46-30)

- The monitoring of the pressure buildup in the injection zone shall be conducted annually including, at a minimum, a shut down of the well for a time sufficient to conduct a valid observation of the pressure fall-off curve. (K.A.R. 28-46-30)

- The static fluid level of the injection interval shall be measured annually using a method approved by KDHE (K.A.R. 28-46-9)

- A monthly monitoring report using a form approved by KDHE shall be submitted to KDHE no later than 28 days after the last day of the month for which the monitoring data are being reported. (K.A.R. 28-46-9, K.A.R. 28-46-12 and K.A.R. 28-46-30)

- The monthly monitoring report shall include all data required by the permit. At a minimum, this shall include daily inspection readings of injection pressure, annulus pressure, injection volume, injection rate, annulus seal pot liquid level, maximum and minimum values for the daily reading of injection flow rate and volume, wellhead annulus pressure. The total volume of liquid injected for the month shall also be reported. In addition, the maximum and minimum values determined from review of all of the continuous recording data for the month shall be reported. (K.A.R. 28-46-9 and K.A.R. 28-46-30)

E. Mechanical Integrity

It is necessary to periodically test the injection well compounds to demonstrate this is no significant leak in the disposal well components (internal mechanical integrity) or significant fluid movement through vertical channels adjacent to the well bore (external mechanical integrity). The test shall be conducted when KDHE believes continued use of the well constitutes a threat to human health or environment. When it has been demonstrated that there is no significant leakage in the well components or no significant fluid movement adjacent to the wellbore, the well is said to have mechanical integrity.

There are two separate parts of mechanical integrity. Part 1 mechanical integrity is demonstrated when there is no significant leak in the casing, injection tubing or the packer. Part 2 is demonstrated when there is no significant fluid movement through vertical channels adjacent to the borehole.

A mechanical integrity test (MIT) plan and schedule shall be submitted to KDHE for review and approval prior to conducting an MIT. No testing shall commence until plan approval has been obtained from KDHE. (K.A.R. 28-46-9). Specific guidelines for test procedures can be obtained by contacting KDHE.

Significant requirements for mechanical integrity are as follows:

Part1 Mechanical Integrity

- A hydraulic pressure test of annulus between the casing and tubing shall be conducted at least once every five years for nonhazardous waste injection wells and at least once annually for hazardous waste injection wells. (K.A.R. 28-46-33)

- The test pressure must be a minimum of 150 psig and the test must be at least one hour in duration. Local geology hydrology, waste characteristics or well design may necessitate a higher test pressure. A pressure loss equal to or less than 5% of the original test pressure is a satisfactory test. A pressure increase greater than 5% is unacceptable and may indicate the well is not in thermal equilibrium and is considered a failure. (K.A.R. 28-46-33)

- For hazardous waste wells, a casing inspection log shall be conducted on the longstring casing at least once every five years. (K.A.R. 28-46-33)

- For hazardous waste wells, a check of the bottom hole cement shall be conducted annually by use of a radioactive tracer or oxygen activation log. (K.A.R. 28-46-33)

Part 2 Mechanical Integrity

- A temperature log or oxygen activation log shall be conducted at least one every five years.

- Plugging and Closure

  At the end of the useful life of the well or when determined necessary by KDHE to protect public health or the environment, the well shall be properly plugged. The well shall be plugged in a manner that is protective of public health and the environment. A plan for plugging the well shall be maintained on file with KDHE. Prior to commencing plugging, an updated plugging plan shall be submitted to KDHE for review and approval. No plugging work shall commence until plan approval has been obtained from KDHE. Detailed guidelines and requirements for developing a plugging plan and for procedures can be obtained by contacting KDHE.

  Significant requirements are as follows:

  - A MIT shall be conducted on the well prior to plug to determine the presence of any problems that might affect the plugging operation and to determine the need for remediation.

  - Remove the tubing and packer from the well. (K.A.R. 28-46-34)

  - A cement bond log, gamma ray-neutron log and any other logs determined necessary by KDHE shall be conducted to determine the need for remedial cementing before commencing the plugging operations. (K.A.R. 28-46-34)

  - For a hazardous Class I well, the well shall be flushed with a buffer field. (K.A.R. 28-46-34)

  - The injection interval shall be squeezed with cement. (K.A.R. 28-46-34)

  - Fill the casing with cement. (K.A.R. 28-46-34)

  - Leave some casing above ground surface, weld a metal plate on the casing inscribed with the Kansas UIC permit number and the date the well was plugged.

- Submit a map showing the tri-coordinate location of the remaining wellhead prepared by a licensed professional land surveyor or a professional engineer licensed to practice in Kansas.

- For a hazardous Class I well, submit a survey plat to the local zoning authority designated by KDHE. This plat shall indicate the tri-coordinate location of the well relative to permanent benchmarks. (K.A.R. 28-46-34)

- For a hazardous well, provide appropriate notification and information to the Kansas Corporation Commission and local authorities that have cognizance over drilling activities to enable such authorities to impose appropriate conditions on subsequent drilling activities that may penetrate the well's confining or injection zone. (K.A.R. 28-46-34)

- For hazardous wells, the owner of a Class I hazardous waste injection well, and the owner of the surface or subsurface property on or in which a Class I hazardous waste injection well is located, must record a notification on the deed to the facility property or on some which is normally examined during a title search that will notify and potential purchaser of the following information. (K.A.R. 28-46-34)

    a. The fact that land has been used to manage hazardous waste;

    b. The name of the State agency or local authority with which the plat was filed, as well as the address of the KDHE office to which it was submitted;

    c. The type and volume of waste injected, the injection interval into which it was injected, and period over which injection occurred.

- Submit a plugging report with related details to KDHE within 30 days of completing the plugging operation on a form provided by KDHE. Document the work done with the appropriated service company cementing reports and "day" reports. (K.A.R. 28-46-9 and K.A.R. 28-46-34)